used by 40%/42% of placebo-/vardenafil-treated patients. The mean change from pre-treatment standing SBP/DBP (mmHg), and HR (bpm) in the subgroup having post-dose data is summarized below.

Treatment Group		Placebo mean (SD)				Vardenafil mean (SD)		
	n	SBP	DBP	HR	n	SBP	DBP	HR
All Patients	183	-0.1 (15.7)	-0.02 (10.1)	-0.2 (10.4)	520	-4.6 (13.9)	-3.1 (8.5)	2.0 (10.3)
No HTM	93	-1.6 (15.6)	-0.4 (9.4)	-0.4 (10.8)	271	-4.2 (12.2)	-2.6 (8.4)	2.0 (10.1)
≥1 HTM	90	1.5 (15.7)	0.4 (10.9)	0.1 (10.0)	249	-5.1 (15.6)	-3.7 (8.7)	1.9 (10.5)

In patients on placebo +/- HTM, no consistent changes in BP and HR were seen. Vardenafil was associated with mild reduction in BP and small increase in HR. Concomitant HTM minimally incrementally reduced SBP/DBP which were generally similar across HTM (ACE-I, Ca+2 antagonist, alpha or beta-blockers, diuretic, or ARB). Incidence of angina, arryhythmia, MI or syncope was low and similar irrespective of treatment.
Conclusion: In this study, concomitant HTM/vardenafil use did not result in vital sign changes of clinical concern compared to those observed by vardenafil alone.

1133-149 Hyperhomocysteinemia Alters Collagen Metabolism in the Hypertensive Heart

Jacob Joseph, Patrick Kennedy, Kerrey Roberto, Abeer Washington, Nawal Shekhawat, Lija Joseph, Richard H. Kennedy, University of Arkansas for Medical Sciences, Little Rock, AR, Central Arkansas Veterans Healthcare, Little Rock, AR

We have recently reported the novel association of hyperhomocysteinemia (Hhe) with adverse cardiac remodeling in hypertension (Joseph et al, American Journal of Physiology, In Press). Specifically we demonstrated that Hhe increased myocardial collagen levels and worsened diastolic function in spontaneously hypertensive rats (SHR). The present study was undertaken to further characterize the mechanisms by which Hhe altered collagen levels in the SHR model.
Methods: Left ventricular myocardial tissue homogenates from SHRs given one of three diets: control, intermediate Hhe-inducing (IH) or severe Hhe-inducing (SH) were used in this study. Western blot analysis was done to analyze collagen I and III protein levels. Gel zymography was used to assess total gelatinolytic activity of the left ventricular myocardium.
Results: Homocysteine levels (micromolar) after 10 weeks of treatment were control - 4.3+/-0.4; IH - 47.1+/-5.1 and SH - 203+/-13.
We observed an increase in collagen I protein level in the Hhe groups as compared to control. The level of collagen III decreased in both Hhe groups, increasing the type I/III collagen ratio as compared to control. Total gelatinolytic activity was also increased in both Hhe groups.
Conclusions: The fibrillar collagens type I and III are major determinants of myocardial systolic and diastolic function. Collagen type I has high tensile strength, while type III collagen is much more compliant. The increase in the ratio of type I/III collagen with Hhe offers a potential explanation for the increased myocardial stiffness and diastolic dysfunction seen in this model. An increase in total gelatinolytic activity accompanied the increase in collagen synthesis, similar to other conditions of fibrosis. In conclusion, altered collagen metabolism seems to be an important determinant of Hhe-induced adverse cardiac remodeling.

1133-150 Trends in Hypertension-Related Mortality in the United States, 1980-1998

Carma Ayala, George A. Mensah, Janet B. Croft, Centers for Disease Control and Prevention, Atlanta, GA, Cardiovascular Health Branch, Atlanta, GA

Background: Deaths from heart disease and stroke have declined in past decades; however, national trends in hypertension (HTN)- related mortality have not been assessed.
Methods: National vital statistics multiple cause mortality files from 1980-1998 were analyzed for decedents ages 45 years and older with HTN (International Classification of Disease code 401-405) listed as one of up to 20 conditions causing death. Racial/ethnic comparisons of HTN-related death were assessed using age-standardized and age-specific rates (per 100,000).
Results: The number of decedents with HTN increased from 127,294 in 1980 to 216,809 in 1998. Overall, the age-standardized rate increased from 285.7 in 1980 to 381.2 in 1998 which was a relative increase of 33% (95% CI=3%-64%). Age-standardized death rates from 1980 to 1998 were consistently highest among black men, followed (in descending order) by black women, white men, and white women. From 1980 to 1998, age-specific death rates for HTN-related mortality increased 175% (95% CI=20%-246%) for ages 85 years and older, 28% (95% CI=4%-55%) for ages 75-84 years, and 8% (95% CI=2%-15%) for ages 65-74 years but decreased -6% (95% CI=-2%- -12%) for ages 45-64 years.
Conclusion: HTN-related mortality has increased in the U.S over the last two decades, especially for adults aged 85 years and older. Because the residual lifetime risk for HTN among middle-aged and elderly adults is high, this trend is likely to continue as the population ages. Prevention of HTN must continue to be pursued and recognized as a strategy to reduce cardiovascular disease morbidity and mortality, especially among black adults. These results also reflect delayed ages for HTN-related mortality. Reductions in HTN-related mortality for adults under age 65 years may have been influenced by national improvements in detection and use of management strategies during the past two decades.

1133-151 Left Ventricular Mechanics and Tissue Characterization in Hypertensive Children: What Are the Earlier Markers of Heart Damage?

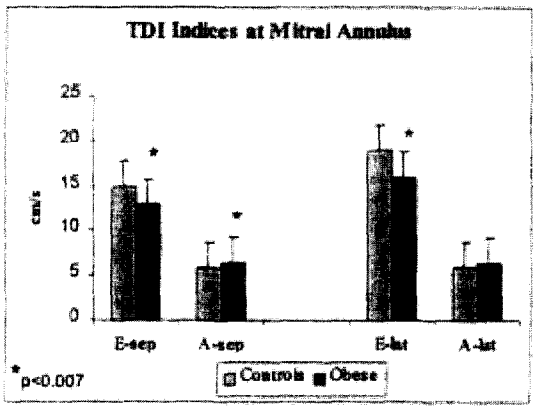
Giuseppe Pacileo Marina Verrengia, Giuseppe Limongelli, Giuliana Lama, Michele Tedesco, Giovanni Di Salvo, Giovanna M. Russo, Raffaele Calabrò, Second University, A.O. Monaldi Hospital, Naples, Italy

Background : Early LV functional abnormalities of hypertension in paediatric age has not been extensively investigated. Thus, we non-invasively assessed LV mechanics and tissue characterization in hypertensive children
Methods: 21 untreated pts (aged 12.1±6 yrs) with renal disease and a recent diagnosis (< 6 months) of hypertension at ambulatory blood pressure monitoring underwent an echocardiographic evaluation. Sex- and age-specific cutoff levels for LV mass/height$^{2.7}$ and relative wall thickness were defined to assess LV geometry, as normal, concentric remodeling(CR), concentric hypertrophy(CH), eccentric hypertrophy(EH). As load-independent index of myocardial contractility, the relation between the midwall rate-corrected velocity of circumferential fiber shortening and meridional end-systolic stress (mwVCFc-s_{es}) was defined. LV diastolic function was evaluated by the mitral flow indexes (peak E, peak A, E/A ratio, deceleration time) and isovolumic relaxation time. Finally, ultrasonic tissue characterization of the LV myocardium was performed by integrated backscatter. In addition, 35 age- and BSA-matched normal subjects were used as control group.
Results: LV geometry was abnormal in 5/21 pts (2 CR, 1 CH, 2 EH) (23%). LVM/height$^{2.7}$, which significantly correlated with mean 24-hours systolic pressure ($r=0.46; p>0.05$) was >51 g/m$^{2.7}$ in 2/21 (9.5%) pts. The mwVCFc-s_{es} relation was normal (M±2SD) in all pts. Isovolumic relaxation time was prolonged in 12/21(57%) pts and deceleration time in 11/21 (52%) pts; peak A was increased in 14/21 (66%) and E/A ratio was decreased in 12/21 (57%) pts. Finally, compared to control group, integrated backscatter analysis did not show significant differences in hypertensive children.
Conclusions: Majority of hypertensive children show early abnormal LV filling, suggestive of impaired diastolic relaxation. Significantly, abnormal LV geometry was detected in 23% and LVM/height$^{2.7}$ was > 51 g/m$^{2.7}$ in 9.5% of pts. Thus, an early echocardiogrphic evaluation of LV diastolic function and geometry allows us to identify a subset of hypertensive children with heart damage and increased risk of cardiovascular morbility .

1133-152 Diastolic Function in Obese Children Assessed by Tissue Doppler Imaging

Holly M. Ippisch, Will L. Border, Sandra A. Witt, Betty J. Glascock, Phil R. Khoury, Thomas R. Kimball, Cincinnati Children's Hospital, Cincinnati, OH

Background: Our previous studies show that obese children have enhanced LV systolic performance and LV hypertrophy. Using traditional mitral inflow indices, diastolic dysfunction has not been apparent. Tissue Doppler imaging (TDI) indices may be more sensitive for detecting diastolic dysfunction. Our aim was to compare TDI indices in obese versus normal children, and to determine correlates of these indices.
Methods: 146 obese children had echocardiograms. Diastolic function was assessed by TDI indices. TDI indices included the early and late peaks of mitral annular velocity at the septum (E-sep, A-sep) and lateral (E-lat, A-lat) walls. LV mass, body mass index, and blood pressure were measured. These data were compared to normal controls.
Results: The TDI indices for E waves (E-sep, E-lat) were lower than controls, and the indices for A waves (A-sep, A-lat) were higher than controls (Figure).



LV mass correlated with A-lat ($r=-0.18$, $p=0.03$). Systolic blood pressure correlated with A-sep ($r=0.19$, $p=0.02$). There was no correlation with body mass index.
Conclusion: TDI indices were significantly different in obese children. These newer indices of diastolic function, may provide a method for serial monitoring for cardiovascular disease. Identification of these children could allow for earlier initiation of interventional strategies aimed at reducing cardiovascular risk.